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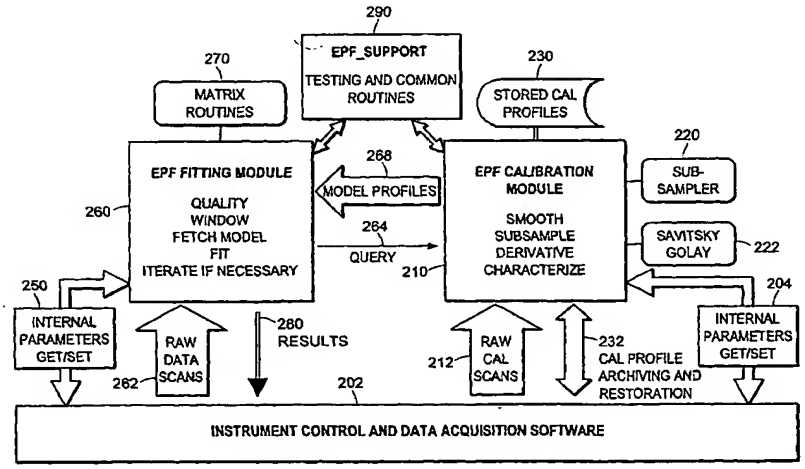
(54) Title: METHOD AND APPARATUS FOR QUANTITATING SURFACE-BINDING OPTICAL RESONANCE PROFILES




(57) Abstract: Empirical profile curve fits (260) are used to quantitative the surface optical resonance profiles (268) using two EPF stages of calibration and fit. The calibration surface binding optical resonance scan is obtained with fine angle or wavelength spacing over a range including the full resonance profiles for all regions. The main calibration module (210) together with the first derivative curves and the diagnostic information generates each profile region of interest. The individual ROI scans are used for measurements of the resonance shifts relative to the empirical profile. In a preferred embodiment the instrument control and data acquisition software sets the internal parameters in the EPT calibration module and sends the raw data from a calibration scan to the EPF Calibration module which funnels the data through a sub sampler and a Savitsky-Golan smoothing routine before taking derivatives and characterizing the data to create the empirical profile for the chip (202).

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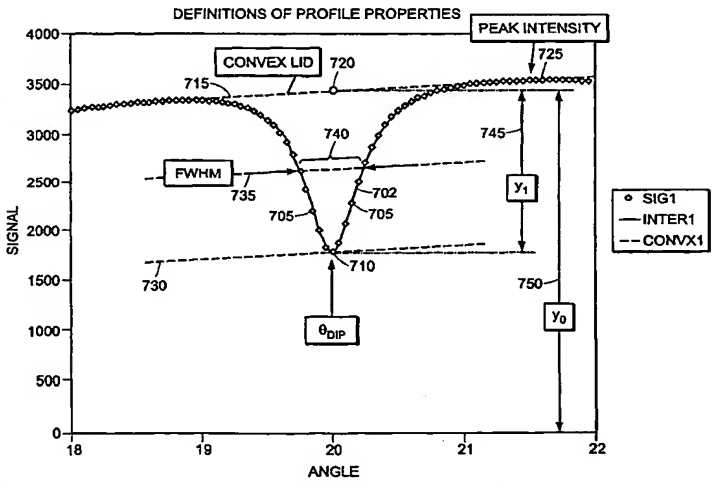
(54) Title: METHOD AND APPARATUS FOR QUANTITATING SURFACE-BINDING OPTICAL RESONANCE PROFILES




(57) Abstract: Empirical Profile Fits are used to quantitate Surface-binding Optical Resonance profiles. The EPF process has two stages, Calibration and Fit. In the Calibration stage, a calibration surface-binding optical resonance scan is obtained with relatively fine angle or wavelength spacing over a range sufficient to include full resonance profiles for all regions. Smoothed, subsampled empirical profiles for each Region of Interest are generated by the main calibration module, together with first derivative curves and diagnostic information. Properties returned may include approximate resonance position, depth, and width. In the Fit stage, individual ROI scans are used for measurement of resonance shifts relative to the empirical profile. The fitting module identifies the region of the experimental scan encompassing the resonance and fits that region using the previously stored empirical profiles, quantifying and returning the desired values, including the shift in the resonance as compared to its location at calibration, estimated absolute angles or wavelengths, time of resonance minimum, and additional diagnostic and quality information. Optionally, data obtained from either Calibration or Fit stages may be exported for analysis on other systems. In a preferred embodiment, Instrument Control and Data Acquisition Software sets internal parameters in the EPF Calibration module and sends raw data from a calibration scan to the EPF Calibration module, which funnels the data through a Subsampler and a Savitsky-Golay smoothing routine before taking derivatives and characterizing the data to create an empirical profile for the chip. The empirical profiles are then optionally stored. Next, Instrument Control and Data Acquisition Software sets internal parameters in the EPF Fitting module and sends raw data from a run-time scan performed utilizing the chip to the EPF Fitting module, which qualifies it, queries the EPF Calibration module for the empirical profile for the chip, and fits the curve, iterating when necessary. Results from the fitting process are then returned and thereby provided to the user.

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